IN THE CLAIMS

Please amend the claims as follows:

1-131. (Cancelled).

132. (Currently Amended) A compound that is a substrate of a cytochrome P450 enzyme and a pro-substrate of a luciferase enzyme, wherein the compound is a 6' structural derivative ~~analog~~ of (4*S*)-4,5-dihydro-2-(6-hydroxy-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin), (4*S*)-4,5-dihydro-2-(benzothiazolyl)-4-thiazolecarboxylic acid (dehydroluciferin) or 2-(4-(hydroxymethyl)-4,5-dihydrothiazol-2-yl)benzo[d]thiazol-6-ol (luciferol) that includes a substitution at the 6' hydroxy site of (4*S*)-4,5-dihydro-2-(6-hydroxy-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin) or 2-(4-(hydroxymethyl)-4,5-dihydrothiazol-2-yl)benzo[d]thiazol-6-ol (luciferol)or the corresponding 6' site of (4*S*)-4,5-dihydro-2-(benzothiazolyl)-4-thiazolecarboxylic acid (dehydroluciferin), which substitution includes

C_{1-20} alkoxy or C_{1-20} alkenyloxy wherein the alkoxy ~~and alkenyloxy~~ are substituted with halogen, hydroxy, amino, cyano, azido, heteroaryl or aryl substituted with haloalkyl; or

C_{3-20} alkynyloxy; or cycloalkoxy, ~~cycloalkylamino, C_{1-20} alkylamino, diC_{1-20} alkylamino, C_{2-20} alkenylamino, diC_{2-20} alkenylamino, C_{2-20} alkenyl C_{1-20}alkylamino, C_{3-20} alkynylamino, diC_{3-20} alkynylamino, C_{3-20} alkynyl C_{1-20}alkylamino, or C_{3-20} alkynyl C_{2-20}alkenylamino, wherein~~ each ~~of the above groups are~~ optionally substituted with halogen, hydroxy, amino, cyano, azido, heteroaryl or aryl substituted with haloalkyl.

133. (Previously Presented) A composition comprising a compound of claim 132 and a buffer.

134. (Original) The composition of claim 133, further comprising a pyrophosphatase.

135. (Cancelled).

136. (Cancelled).

137. (Currently Amended) A compound selected from the group consisting of

4,5-dihydro-2-(6-(2-chloroethoxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 2-chloroethyl ether);

4,5-dihydro-2-(6-(benzyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' benzyl ether);

4,5-dihydro-2-(6-(4-picolinyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 4-picolinyl ether);

4,5-dihydro-2-(6-(4-trifluoromethylbenzyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 4-trifluoromethylbenzyl ether);

4,5-dihydro-2-(6-(phenylethoxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' phenylethyl ether);

4,5-dihydro-2-(6-(geranyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' geranyl ether);

4,5-dihydro-2-(6-(prenyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' prenyl ether);

4,5-dihydro-2-(6-(2-picolinyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 2-picolinyl ether); and

4,5-dihydro-2-(6-(3-picolinyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 3-picolinyl ether).

138. (Currently Amended) The compound according to claim 137 selected from the group consisting of

4,5-dihydro-2-(6-(benzyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' benzyl ether);

4,5-dihydro-2-(6-(phenylethoxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' phenylethyl ether);

4,5-dihydro-2-(6-(geranyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' geranyl ether); and

4,5-dihydro-2-(6-(prenyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' prenyl ether).

139. (Currently Amended) The compound according to claim 137 selected from the group consisting of

4,5-dihydro-2-(6-(2-chloroethoxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 2-chloroethyl ether);

4,5-dihydro-2-(6-(4-picolinyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 4-picolinyl ether);

4,5-dihydro-2-(6-(4-trifluoromethylbenzyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 4-trifluoromethylbenzyl ether);

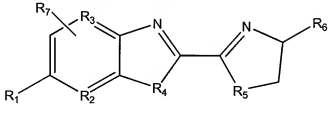
4,5-dihydro-2-(6-(2-picolinyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 2-picolinyl ether); and

4,5-dihydro-2-(6-(3-picolinyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 3-picolinyl ether).

140-167. (Cancelled).

168. (Previously Presented) The composition according to claim 134 wherein the pyrophosphatase is an inorganic pyrophosphatase.

169. (Currently Amended) A compound having the formula:



wherein

R_1 represents hydrogen, hydroxy, C_{1-20} alkoxy or C_{1-20} alkenyloxy, wherein the alkoxy ~~and alkenyloxy~~ are substituted with halogen, hydroxy, amino, cyano, azido, heteroaryl or aryl substituted with haloalkyl; or

R_1 represents C_{3-20} alkynyloxy; or cycloalkoxy, ~~cycloalkylamino, C_{1-20} alkylamino, diC_{1-20} alkylamino, C_{2-20} alkenylamino, diC_{2-20} alkenylamino, C_{2-20} alkenyl C_{1-20}alkylamino, C_{3-20} alkynylamino, diC_{3-20} alkynylamino, C_{3-20} alkynyl C_{1-20}alkylamino, or C_{3-20} alkynyl C_{2-20}alkenylamino, wherein~~ each ~~of the above groups are~~ optionally substituted with halogen, hydroxy, amino, cyano, azido, heteroaryl or aryl substituted with haloalkyl;

R_2 and R_3 independently represent C or N;

R_4 and R_5 independently represent S, O, NR_8 wherein R_8 represents hydrogen or C_{1-20} alkyl, or CR_9R_{10} wherein R_9 and R_{10} independently represent H, C_{1-20} alkyl or fluorine;

R_6 represents CH_2OH; COR_{11} wherein R_{11} represents hydrogen, hydroxy, C_{2-20} alkenyl, or $-OM^+$ wherein M^+ is an alkali metal or a pharmaceutically acceptable salt; and

R_7 represents hydrogen, C_{1-6} alkyl, C_{2-20} alkenyl, halogen or C_{1-6} alkoxy; provided that

when R_1 is hydroxy, R_7 is not hydrogen, R_{11} is not hydroxy, R_2 and R_3 are not both carbon, and R_4 and R_5 are not both S ((4*S*)-4,5-dihydro-2-(6-hydroxy-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin));

when R_1 is hydrogen, R_7 is not hydrogen, R_{11} is not hydroxy, R_2 and R_3 are not both carbon, and R_4 and R_5 are not both S ((4*S*)-4,5-dihydro-2-(benzothiazolyl)-4-thiazolecarboxylic acid ((dehydroluciferin)); and

when R_1 is hydroxy, R_7 is not hydrogen, R_6 is not CH_2OH, R_2 and R_3 are not both carbon, and R_4 and R_5 are not both S (2-(4-(hydroxymethyl)-4,5-dihydrothiazol-2-yl)benzo[d]thiazol-6-ol (luciferol)).

170. (Previously Presented) A composition comprising a compound of claim 169 and a buffer.

171. (Previously Presented) The composition of claim 170, further comprising a pyrophosphatase.

172. (Previously Presented) The composition according to claim 171 wherein the pyrophosphatase is an inorganic pyrophosphatase.

173. (Currently Amended) The composition ~~compound~~ according to claim 170 ~~claim 169 selected from the group consisting of~~ wherein the compound is

4,5-dihydro-2-(6-(2-chloroethoxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 2-chloroethyl ether);

4,5-dihydro-2-(6-(4-picolinyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 4-picolinyl ether);

4,5-dihydro-2-(6-(4-trifluoromethylbenzyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 4-trifluoromethylbenzyl ether);

4,5-dihydro-2-(6-(2-picolinyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 2-picolinyl ether); or

4,5-dihydro-2-(6-(3-picolinyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' 3-picolinyl ether).

174. (Cancelled).

175. (Currently Amended) The composition of claim 173 ~~claim 174~~, further comprising a pyrophosphatase.

176. (Previously Presented) The composition according to claim 175 wherein the pyrophosphatase is an inorganic pyrophosphatase.

177. (Currently Amended) The composition ~~compound~~ according to claim 170 ~~claim 169 selected from the group consisting of~~ wherein the compound is

4,5-dihydro-2-(6-(benzyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' benzyl ether);

4,5-dihydro-2-(6-(phenylethoxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' phenylethyl ether);

4,5-dihydro-2-(6-(geranyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' geranyl ether); or

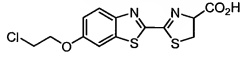
4,5-dihydro-2-(6-(prenyloxy)-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin 6' prenyl ether).

178. (Cancelled).

179. (Currently Amended) The composition of claim 177 ~~claim 178~~, further comprising a pyrophosphatase.

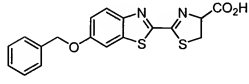
180. (Previously Presented) The composition according to claim 179 wherein the pyrophosphatase is an inorganic pyrophosphatase.

181. (Previously Presented) The compound according to claim 169 that has the structure



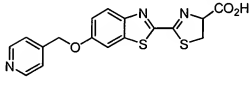
or a salt thereof.

182. (Previously Presented) The compound according to claim 169 that has the structure



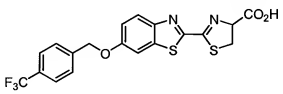
or a salt thereof.

183. (Previously Presented) The compound according to claim 169 that has the structure



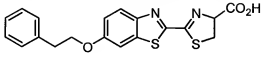
or a salt thereof.

184. (Previously Presented) The compound according to claim 169 that has the structure



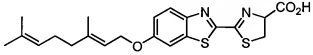
or a salt thereof.

185. (Previously Presented) The compound according to claim 169 that has the structure



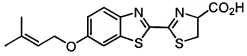
or a salt thereof.

186. (Previously Presented) The compound according to claim 169 that has the structure



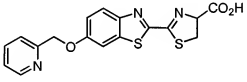
or a salt thereof.

187. (Previously Presented) The compound according to claim 169 that has the structure



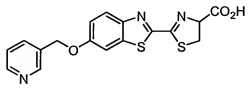
or a salt thereof.

188. (Previously Presented) The compound according to claim 169 that has the structure



or a salt thereof.

189. (Previously Presented) The compound according to claim 169 that has the structure



or a salt thereof.

190. (Withdrawn; Currently Amended) A kit for determining the effect of a substance on cytochrome P450 enzyme activity comprising:

(a) one or more luminogenic compounds wherein the compound is a cytochrome P450 enzyme substrate and a pro-substrate of luciferase enzyme, wherein the compound is a 6' structural derivative ~~analog~~ of (4*S*)-4,5-dihydro-2-(6-hydroxy-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin), (4*S*)-4,5-dihydro-2-(benzothiazolyl)-4-thiazolecarboxylic acid (dehydroluciferin) or 2-(4-(hydroxymethyl)-4,5-dihydrothiazol-2-yl)benzo[d]thiazol-6-ol (luciferol) that includes a substitution at the 6' hydroxy site of (4*S*)-4,5-dihydro-2-(6-hydroxy-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin) or 2-(4-(hydroxymethyl)-4,5-dihydrothiazol-2-yl)benzo[d]thiazol-6-ol (luciferol)or the corresponding 6' site of (4*S*)-4,5-dihydro-2-(benzothiazolyl)-4-thiazolecarboxylic acid (dehydroluciferin), which substitution includes

C_{1-20} alkoxy or C_{1-20} alkenyloxy wherein the alkoxy ~~and alkenyloxy~~ are substituted with halogen, hydroxy, amino, cyano, azido, heteroaryl or aryl substituted with haloalkyl; or

C_{3-20} alkynyloxy; or cycloalkoxy, ~~cycloalkylamino, C_{1-20} alkylamino, diC_{1-20} alkylamino, C_{2-20} alkenylamino, diC_{2-20} alkenylamino, C_{2-20} alkenyl C_{1-20}alkylamino, C_{3-20} alkynylamino, diC_{3-20} alkynylamino, C_{3-20} alkynyl C_{1-20}alkylamino, or C_{3-20} alkynyl C_{2-20}alkenylamino, wherein~~ each ~~of the above groups are~~ optionally substituted with halogen, hydroxy, amino, cyano, azido, heteroaryl or aryl substituted with haloalkyl; and

(b) directions for using the kit.

191. (Withdrawn) The kit according to claim 190, further comprising one or more bioluminescent enzymes.

192. (Withdrawn) The kit according to claim 191 wherein the bioluminescent enzyme is a luciferase.

193. (Withdrawn) The kit according to claim 191 wherein the bioluminescent enzyme is a firefly or a Renilla luciferase.

194. (Withdrawn) The kit according to claim 190 further comprising ATP and magnesium ions.

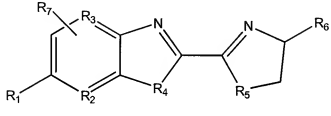
195. (Withdrawn) The kit according to claim 194 further comprising a detergent.

196. (Withdrawn) The kit according to claim 195 wherein the detergent is non-ionic.

197. (Withdrawn; Previously Presented) The kit according to claim 195 further comprising a pyrophosphatase.

198. (Withdrawn) The kit according to claim 197 wherein the pyrophosphatase is an inorganic pyrophosphatase.

199. (Withdrawn; Currently Amended) The kit according to claim 198 wherein the compound has the formula:



wherein

R_1 represents hydrogen, hydroxy, C_{1-20} alkoxy or C_{1-20} alkenyloxy, wherein the alkoxy ~~and alkenyloxy~~ are substituted with halogen, hydroxy, amino, cyano, azido, heteroaryl or aryl substituted with haloalkyl; or

R_1 represents C_{3-20} alkynyloxy; or cycloalkoxy, ~~cycloalkylamino, C_{1-20} alkylamino, diC_{1-20} alkylamino, C_{2-20} alkenylamino, diC_{2-20} alkenylamino, C_{2-20} alkenyl C_{1-20}alkylamino, C_{3-20} alkynylamino, diC_{3-20} alkynylamino, C_{3-20} alkynyl C_{1-20}alkylamino, or C_{3-20} alkynyl C_{2-20}alkenylamino, wherein~~ each ~~of the above groups are~~ optionally substituted with halogen, hydroxy, amino, cyano, azido, heteroaryl or aryl substituted with haloalkyl;

R_2 and R_3 independently represent C or N;

R_4 and R_5 independently represent S, O, NR_8 wherein R_8 represents hydrogen or C_{1-20} alkyl, or CR_9R_{10} wherein R_9 and R_{10} independently represent H, C_{1-20} alkyl or fluorine;

R_6 represents CH_2OH; COR_{11} wherein R_{11} represents hydrogen, hydroxy, C_{2-20} alkenyl, or $-OM^+$ wherein M^+ is an alkali metal or a pharmaceutically acceptable salt; and

R_7 represents hydrogen, C_{1-6} alkyl, C_{2-20} alkenyl, halogen or C_{1-6} alkoxy; provided that

when R_1 is hydroxy, R_7 is not hydrogen, R_{11} is not hydroxy, R_2 and R_3 are not both carbon, and R_4 and R_5 are not both S ((4*S*)-4,5-dihydro-2-(6-hydroxy-benzothiazolyl)-4-thiazolecarboxylic acid (luciferin));

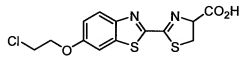
when R_1 is hydrogen, R_7 is not hydrogen, R_{11} is not hydroxy, R_2 and R_3 are not both carbon, and R_4 and R_5 are not both S ((4*S*)-4,5-dihydro-2-(benzothiazolyl)-4-thiazolecarboxylic acid ((dehydroluciferin)); and

when R_1 is hydroxy, R_7 is not hydrogen, R_6 is not CH_2OH, R_2 and R_3 are not both carbon, and R_4 and R_5 are not both S (2-(4-(hydroxymethyl)-4,5-dihydrothiazol-2-yl)benzo[d]thiazol-6-ol (luciferol)).

200. (Withdrawn) The kit according to claim 190, further comprising a reversible luciferase inhibitor.

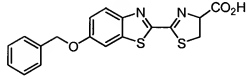
201. (Withdrawn) The kit according to claim 200, wherein the reversible luciferase inhibitor is 2-(4-aminophenyl)-6-methylbenzothiazole (APMBT) or 2-amino-46-methylbenzothiazole (AMBT).

202. (Withdrawn) The kit according to claim 190 wherein the compound has the structure



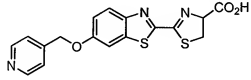
or a salt thereof.

203. (Withdrawn) The kit according to claim 190 wherein the compound has the structure



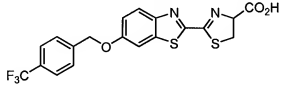
or a salt thereof.

204. (Withdrawn) The kit according to claim 190 wherein the compound has the structure



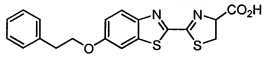
or a salt thereof.

205. (Withdrawn) The kit according to claim 190 wherein the compound has the structure



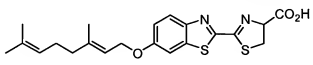
or a salt thereof.

206. (Withdrawn) The kit according to claim 190 wherein the compound has the structure



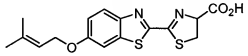
or a salt thereof.

207. (Withdrawn) The kit according to claim 190 wherein the compound has the structure



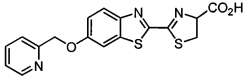
or a salt thereof.

208. (Withdrawn) The kit according to claim 190 wherein the compound has the structure



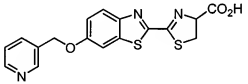
or a salt thereof.

209. (Withdrawn) The kit according to claim 190 wherein the compound has the structure



or a salt thereof.

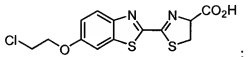
210. (Withdrawn) The kit according to claim 190 wherein the compound has the structure



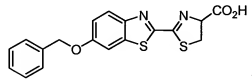
or a salt thereof.

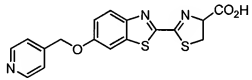
211. (Withdrawn) A kit for determining the effect of a substance on cytochrome P450 enzyme activity comprising:

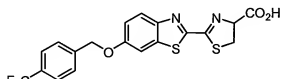
(a) one or more luminogenic compounds, wherein the compound is a cytochrome P450 enzyme substrate and a pro-substrate of luciferase enzyme, and the compound is a selected from



;


;


;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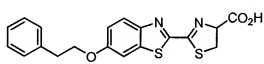
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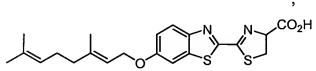
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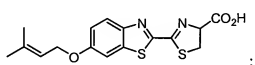
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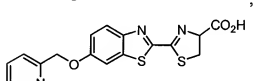
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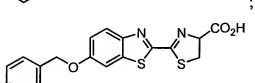
;

or a salt thereof;

(b) one or more bioluminescent enzymes;

(c) a buffer; and

(c) directions for using the kit.

212. (Withdrawn) The kit according to claim 211 wherein the bioluminescent enzyme is a luciferase.

213. (Withdrawn) The kit according to claim 211 wherein the bioluminescent enzyme is a firefly or a Renilla luciferase.

214. (Withdrawn) The kit according to claim 211 further comprising ATP and magnesium ions.

215. (Withdrawn) The kit according to claim 214 further comprising a detergent.

216. (Withdrawn; Previously Presented) The kit according to claim 215 wherein the detergent is non-ionic.

217. (Withdrawn) The kit according to claim 215 further comprising a pyrophosphatase.

218. (Withdrawn) The kit according to claim 217 wherein the pyrophosphatase is an inorganic pyrophosphatase.

219. (Withdrawn) The kit according to claim 211, further comprising a reversible luciferase inhibitor.

220. (Withdrawn) The kit according to claim 219, wherein the reversible luciferase inhibitor is 2-(4-aminophenyl)-6-methylbenzothiazole (APMBT) or 2-amino-46-methylbenzothiazole (AMBT).